

**CLAIMS**

1. Screw (1) for the electrical connection of a cable terminal to a railway track or the like, comprising a base body (2) having:

- 5 - an elongated shank (3) having a longitudinal axis (L),
- a strike head (4) connected with a first end of the shank (3),
- means (6) for the removable connection of a strike organ or nut (5) with a second end of the shank (3) opposite said
- 10 first end, said screw (1) further comprising:

- a support element (7) manufactured separately from the base body (2) and associated to the strike head (4) so as to form a stroke (11) that defines a cavity (9) turned towards the second end of the shank (3), characterized in
- 15 that the screw (1) is pre-assembled and comprises means (10, 8) making a substantially irreversible connection of the support element (7) to the base body (2).

2. The screw (1) according to the claim 1, wherein the strike head (4) and the shank (3) are formed integrally.

- 20 3. The screw (1) according to the claim 1 or 2, wherein said removable connection means (6) comprise an outer threading (6) of the shank (3) suitable to engage a corresponding inner threading of the strike organ or nut (5).

- 25 4. The screw (1) according to any of the previous claims,

wherein the support element (7) and the base body (2) are substantially integral in rotation around the longitudinal axis (L).

5     5. The screw (1) according to any of the previous claims, wherein the support element (7) and the base body (2) are substantially integral in translation along the longitudinal axis (L).

10    6. The screw (1) according to any of claims 4 or 5, wherein said rotably and/or translatably integral connection is made by a shape coupling between the support element (7) and the base body (2).

15    7. The screw (1) according to any of the previous claims, wherein the irreversible connection means (10) enable limited relative movements between the support element (7) and the base body (2).

8. The screw (1) according to the claim 7, wherein the irreversible connection means (10) enable an inclination of the support element (7) in relation to the longitudinal axis (L).

20    9. The screw (1) according to any of the previous claims, wherein the irreversible connection means (10) are at least partially deformable and configured so as to

- connect the base body (2) and the support element (7) rigidly when the irreversible connection means (10) are not  
25    deformed and

- enable limited relative movements between the base body (2) and the support element (7) when the irreversible connection means (10) are deformed.

10. The screw (1) according to any of the previous claims,  
5 wherein the irreversible connection means (10) deform plastically during the tightening of the screw (1) on irregular surfaces.

11. The screw (1) according to any of the previous claims,  
wherein said cavity (9) is ring shaped and extends and  
10 around the shank (3).

12. The screw (1) according to any of the previous claims,  
wherein the support element (7) has the shape of a flattened cap provided with a central aperture (12) that houses the shank (3) of the screw (1).

15 13. The screw (1) according to claim 12, wherein the central aperture (12) is a hole having a greater diameter than the diameter of the shank (3), thus providing a gap between the shank (3) and the interdos of the hole (12).

14. The screw (1) according to any of the previous claims,  
20 wherein said irreversible connection means (10) comprise one or more projecting parts (10) that protrude from the shank (3) and rest against the support element (7) thus keeping it in contact with the strike head (4).

15. The screw (1) according to the previous claim, wherein  
25 said projecting parts (10) protrude radially in relation to

the longitudinal axis (L).

16. The screw (1) according to claim 14 or 15, wherein said projecting parts (10) are distributed at constant pitch around the shank (3).

5 17. The screw (1) according to the claim 16, comprising three projecting parts (10).

18. The screw (1) according to one of claims 14 to 17, wherein said projecting parts (10) are obtained by the deformation of the material of the shank (3).

10 19. The screw (1) according to any of the previous claims, wherein the support element (7) comprises a polygonal impression (8) that engages the strike head (4) in order to make a joined shape coupling rotatably integral around the longitudinal axis (L).

15 20. The screw (1) according to any of the previous claims, wherein said base body (2) and said support element (7) are in a metallic material, preferably steel.

21. Nut for the electrical connection of a cable terminal to a railway track or the like , comprising a strike organ  
20 and means for the removable connection of the strike organ with a screw, and a support element (7) manufactured separately from the strike organ and associable thereto so as to form a stroke that defines a cavity destined to be turned towards a strike head of said screw, characterized  
25 in that the nut is pre-assembled and comprises means making

a substantially irreversible connection of the support element to the strike organ.

22. Method for manufacturing a screw (1) according to any of claims 1 to 20, comprising the following steps:

5 providing a base body (2) having:

- an elongated shank (3) having a longitudinal axis (L),
- a strike head (4) connected with a first end of the shank (3),

10 - means (6) for the removable connection of a strike organ or nut (5) with a second end of the shank (3) opposite said first end, to provide a support element (7) manufactured separately from the base body (2) and provided with a cavity (9) and an aperture (12) suitable to house the shank (3);

15 inserting the shank (3) of the base body (2) into the aperture (12) of the support element (7) to the point in which the support element (7) abuts against the strike head (4) so as to form a stroke (11) that defines a cavity (9) turned towards the second end of the shank (3),

20 characterized by the step of:

deforming the material of the shank (3) in order to form one or more projecting parts (10) that make a substantially irreversible connection of the support element (7) to the base body (2).

25 23. The method for manufacturing a screw (1) according to

the claim 22, wherein the deformation step of the material of the shank (3) takes place when cold.

24. The method for manufacturing a screw (1) according to one of claims 22 to 23, comprising the step of shifting  
5 material of the surface of the shank (3) along a longitudinal axis (L) thereof in the direction of the strike head (4) without completely detaching said material from the shank (3) in order to obtain burrs or shavings (10) that rest against the support element (7) leaned in  
10 turn against the strike head (4).

25. The method according to one of claims 22 to 24, comprising the phase of pressing the strike head (4) against the support element (7), so as to form, in the support element (7), an impression (8) having the shape,  
15 preferably polygonal, of the strike head (4).

26. The method according to claim 25, wherein the run-out of the step of pressing the strike head (4) against the support element (7) is defined by the elimination of the distance present between the support element (7) and a  
20 guide element (30a) of the incision tips.

27. Equipment (13) for irreversibly connecting a support element (7) to a base body (2) in order to manufacture a screw (1) according to claim 1, wherein said base body (2) comprises:

25 - an elongated shank (3) having a longitudinal axis (L),

- a strike head (4) connected with a first end of the shank (3),
- means (6) for the removable connection of a strike organ or nut (5) with a second end of the shank (3) opposite said first end, and said support element (7) is manufactured separately from the base body (2) and associated to the strike head (4) so as to form a stroke (11) that defines a cavity (9) turned towards the second end of the shank (3), said equipment comprising:
  - 10 - a base plate (14) provided with one or more activation organs (23);
  - a support device (17) that defines a seat (26) suitable to house at least a part of the base body (2) of the screw (1);
  - 15 - one or more incision tools (24) provided with an incision tip (30),
  - sliding connection means (15, 16) that connect the support device (17) to the base plate (14) slidingly along a sliding axis (S), wherein the activation organs (23)
  - 20 interact with the incision tools (24) so that the movement of the support device (17) in relation to the base plate (14) entails a movement of the incision tools (24) in relation to the seat (26) so that the incision tips (30) deform the material of the shank (3) in order to form one
  - 25 or more projecting parts (10) that make said substantially

irreversible connection of the support element (7) to the base body (2).

28. The equipment (13) according to the claim 27, wherein said one or more incision tools (24) are provided with a  
5 activation portion (32), said incision tip (30) and said activation portion (32) being adjustable in relation to one another in order to vary the total length of the incision tool (24).

29. The equipment (13) according to the claim 27 or 28,  
10 wherein the sliding axis (S) is substantially parallel to a longitudinal axis of the seat (26) and said incision tips (30) extend along inclined axes in relation to the sliding axis (S).

30. The equipment (13) according to one of the claims from  
15 27 to 29, wherein said sliding connection means comprise guide pins (15) slidably housed in holes (16).

31. The equipment (13) according to one of claims 27 to 30, wherein said incision tools (24) are at least partially housed in special cavities (25) formed in the support  
20 device (17) that make movement guides thereof.

32. The equipment (13) according to one of claims from 27 to 31, comprising elastic means (35) acting between said support device (17) and said incision tools (24) so as to stress the incision tools (24) elastically in a rest  
25 position, in which the incision tips (30) are retracted



from the seat (26).

33. The equipment according to the claim 32, wherein said elastic means (35) are housed inside the cavities (25) for the incision tools (24).

5 34. The equipment according to one of claims from 27 to 33, wherein said support device (17) and said base plate (14) comprise stop surfaces suitable to rest against one another in order to limit the sliding movement of the support device (17) in relation to the support plate (14).